CHAPTER 6
SITE RECONNAISSANCE

6-1. Introduction.

a. This chapter discusses the elements of an OE response Site Reconnaissance (RECON) tasking that should be addressed by the project team. The RECON tasking is an optional element within the EE/CA phase of the OE response process. If implemented, RECON is the first task of the EE/CA phase. The purpose of the RECON tasking is to:

(1) Build upon site-specific data gathered during the PAE and SI phases in an effort to save costs associated with the EE/CA investigation;

(2) Provide detailed information that can be used by the project team to refine the SOW and cost estimate for the subsequent EE/CA investigation; and

(3) Identify any areas of concern with imminent OE hazards requiring implementation of a TCRA.

b. Based on the adequacy of existing site information for development of a definitive EE/CA SOW, the project team should include RECON in the project schedule. The government may complete the RECON task and supply the result to the EE/CA contractor as Government Furnished Information or the RECON task may be conducted by the EE/CA contractor as an independent task.

6-2. Data Quality Objectives.

a. The project team should consider data quality objectives for each of the following areas during the preparation of the RECON SOW.

(1) Geospatial Data and Geospatial Data Systems (GD&S). The project team should develop project-specific GD&S requirements for inclusion in the SOW for each OE project in accordance with Chapter 9, “Geospatial Data and Systems”. GD&S requirements should include site-specific standards for the format, transfer, and storage of all geospatial data. Factors influencing formulation of data standards include:

(a) Compatibility with current OE MCX and district hardware and software platforms;

(b) Existing digital data and geo-spatial referenced mapping; and

(c) Usability by all parties of concern, including stakeholders.

(2) Spatial Data Reference System. Unless otherwise specified, all horizontal control will be based on either the English or metric system and reference to the North American Datum of 1983 (NAD83) and the State Plane Grid System for the project location. Vertical control, if required, will also be based on either the English or metric system and referenced to the North American Datum of 1988 (NAVD88).

(3) Base Mapping. Aerial photography provides a cost-effective means of developing a base map for an OE response project. The process of developing historic site use and characterization requires a level of detail that is generally well within the normal resolving power of aerial photography collected under normal conditions. Resolution values of one meter or less are desired for identification of features and boundaries between former as well as current land uses.

(4) Composite Data Modeling. Geographic positioning of interpreted features from one time frame or photography scale to another should be carefully monitored. A good-quality scale-compatible base map will serve to minimize this problem. Enlargements of orthophotography and other scale-controlled photography for map production should not exceed an upper scale limit of twice the original scale. Enlargements greater than two times require some degree of field verification of resulting solutions.

(5) Scale and Resolution. The original data scale and resolution or detection properties of the data should be clearly identified with each data set in order to ensure that no misleading detail is implied.

(6) Imaging/Remote Sensing. Airborne geophysical surveys for gross characterization of potential OE contaminated sites are advancing technology procedures. The nature, scope, and cost of these methods dictate that specialized contractors should provide these services, if utilized. The airborne geophysical contractor should have experience, equipment, and documented results from prior airborne services.

(7) Probability of Detection (Pd). The project team developing the SOW should determine the minimum criteria and level of confidence the contractor should meet to have an acceptable Pd performance for any airborne geophysical mapping.

(8) Horizontal Accuracy. The project team should state in the SOW the horizontal accuracy required for any geophysical mapping and reacquisition of data. The horizontal accuracy statements should address the minimum percentile(s) of all identified point targets that should lie within defined radii of their surveyed surface position.

(9) Spatial Analysis/Stratification. Correlated geospatial data should be used by the project team to assist in making informed decisions on delineation of area of concern footprints. A reduction in the area of concern footprints could result from using spatial analysis and stratification to differentiate probable levels of UXO contamination (“Footprint Reduction”).

Ground-borne site characterization efforts can then be cost-effectively allocated to those portions of the site containing the greatest levels of concern. Therefore, the project team should develop minimum acceptable validation criteria for the correlation between derived solutions and actual conditions. Portions with lower levels of concern may be excluded from further OE response actions or designated as areas requiring limited confirmation sampling during the EE/CA phase.

(10) Quality Control. A number of quality control parameters should be evaluated on each geospatial data set in order to ensure that the whole RECON effort assembled for a site is of equal reliability. These parameters include the reliability of each set of photographs or images, the reliability of the interpretation of each set, the scale quality of each set, and the relationship of each set to the selected base mapping.

b. An important and common standard for all presentations of data is the inclusion of proper and sufficient notation on maps indicating the data sources, data interpretation and preparation methods, and their geographic integrity.

6-3. Statement of Work.

a. The SOW for a RECON task should be prepared by personnel with a detailed knowledge of the project's history, geospatial data, geospatial data systems, aerial photogrammetry, photo interpretation, spatial data analyses, range characteristics, UXO risk assessment processes and procedures, geophysical survey methodologies, and statistical sampling strategies. The RECON SOW should be results-oriented. In preparing the SOW for the RECON tasking, the project team should review the site-specific requirements as they relate to the following:

(1) Work Plan and ASSHP;

(2) Analysis of the ASR;

(3) Spatial analysis (aerial survey);

(4) Ground reconnaissance;

(5) Technology evaluation; and

(6) Analysis report/data archive.

b. The project team should ensure that the RECON SOW specifies that all geophysical investigations will be managed by a qualified geophysicist as defined in Chapter 7 and that all characterization sampling and analysis methodologies are managed by a qualified professional with a background in statistics.

6-4. Planning Considerations. Each RECON action requires selection of equipment and methodologies that will accomplish the end objective without wasting manpower, time, and money. The selected RECON strategy should be unambiguous and provide the project team with the capability to develop a response action that will yield reasonably safe use of each identified area of the project for the planned land use specified by the stakeholder. Attachment 6-1 is a checklist to be used when planning the RECON activity.

a. RECON Work Plan. The RECON Work Plan should definitively describe the operational parameters to be followed during execution of each RECON activity discussed below.

(1) Analysis of the ASR. The RECON Work Plan should discuss how the existing ASR data will be enhanced and converted into a spatially coincident digital format. This conversion of data will allow the historical and site information to be used throughout the project.

(2) Spatial Analysis (Aerial Survey). The RECON Work Plan should discuss the methodology for conducting a detailed analysis of spatial data. Spatial analysis may provide information to assist in making valid decisions regarding predicted areas of interest at the site by differentiating potentially contaminated areas from uncontaminated areas.

(3) Ground Reconnaissance. The Work Plan should discuss the procedures that will be implemented to conduct a ground reconnaissance (ground RECON) to verify the results of the spatial analysis.

(4) Technology Evaluation. The RECON Work Plan should discuss the methodology for the technology evaluation. The purpose of the technology evaluation is to determine which OE detection instrument is most appropriate for a specific site within a reasonable cost.

(5) Analysis Report and Data Archive. The Work Plan will discuss the procedures to be used to archive the results of the ASR analysis, spatial analysis, ground RECON, and technology evaluation.

b. ASSHP. Since all RECON activities will be accomplished using approved anomaly avoidance procedures, an ASSHP may be utilized to address health and safety requirements. The ASSHP is prepared when preliminary project activities are non-intrusive and occur prior to the approval of the site-specific EE/CA Work Plan and SSHP. If a contractor will be executing the RECON, the UXO Safety Officer (UXOSO) will prepare the ASSHP. If only government personnel are involved in the RECON, the OE Safety Specialist will prepare the ASSHP. All site visit participants will read, sign and comply with the ASSHP and attend all safety briefings held by the UXOSO or OE Safety Specialist (as applicable). On FUDS projects, the property owner may accompany the site visit team and should be invited to attend safety briefings even though they cannot be expected to comply with the ASSHP. If the site is operating under an existing

SSHP that adequately addresses the appropriate OE safety issues, an ASSHP is not required. The ASSHP should be prepared in accordance with EP 1110-1-18.

c. Archival Data Compilation and Correlation.

(1) Data compilation and correlation starts with selection or construction of a base map that includes not only the project site but also such adjacent mapping attributes that may provide influences on, or be influenced by, OE response activities. Valid historic land-use characterization and site descriptions are best developed where aerial photographs or scanner images have been recorded during previous site use. Sources and characteristics of available historic photographs are described in Chapter 9, EM 1110-1-1802, Geophysical Exploration for Engineering and Environmental Investigations.

(2) Construction of a geospatially correct base map will expedite conversion of ASR data into a spatially coincident digital format. This correlation of data will enhance integration and life cycle management of historical and newly collected project information. Many of the daily operational procedures for a range may be interpreted from the evidence recorded on aerial photography. Activity types and previous land use may be identified by photographic or image clues, such as open trenches, burning debris piles, ground and water discoloration, grading scars, vehicle tracks, and structure remains. The sequence of the disturbance and approximate chronology may also be established.

d. Geo-Spatial Data Collection. Site-specific data gathered during archival data compilation and correlation may not, in many cases, be sufficiently detailed to support initial stages of the OE response decision-making process. Therefore, supplemental characterization data (i.e., aerial geophysical surveys, aerial mapping) may be collected during the RECON tasking.

(1) Aerial Mapping. All aerial mapping activities required by the project team to support data analysis and footprint reduction should be completed consistent with the requirements of EM 1110-1-1000, Photogrammetric Mapping.

(2) Conventional Mapping. All conventional mapping activities required by the project team should be completed in accordance with Engineer Circular (EC) 1110-1-73, Standards and Specifications for Surveys, Maps, Engineering Drawings, and Related Spatial Data Products and Software. In addition, requirements from the Tri-Service Spatial Data Standard (TSSDS) should be applied to conventional mapping.

e. Data Analysis/Footprint Reduction. Significant portions of larger tracts of land may be initially identified that do not require or result in any OE response action. Data analysis should be used to identify which portions of these larger tracts possess attributes attributable to UXO contamination requiring further OE response actions and should result in reduction of the investigation footprint as appropriate.

f. Field Confirmation.

(1) Field confirmation is required to verify and validate the results of the data analysis and footprint reduction. Reconnaissance personnel should review areas excluded for any evidence of OE contamination such as changes in vegetation, topographic and soil deformations and ground scars.

(2) Rights-of-entry are required for field confirmation activities on lands outside federal, state, or local governmental ownership.

g. Geophysical Technology Assessment. An assessment of geophysical technology (e.g., Instrument Prove Out, as described in Chapter 7) may be more effectively accomplished during the RECON phase. This would enable the project team to prepare a more definitive EE/CA SOW with regard to geophysical sampling.

h. Data Archive. A database tracking system should be established to archive all information gathered during the RECON phase. This database should contain information on all historic and current activities at the site. The data archive may be used to support the decision to continue or discontinue an investigation in an area of concern.

i. Report Preparation. The results of all RECON actions should be compiled into an Analysis Report. This information can then be used in developing the EE/CA SOW and documentation supporting any required TCRA.

ATTACHMENT 6-1
SITE RECONNAISSANCE CHECKLIST

Project Name: _____
Project Location: _____
Design Center POC: _____
Preparer's Name and Title: _____
Date of Preparation: _____

	Y	N	N/A
RECON Planning Considerations			
1. Have Data Quality Objectives in the following areas been considered for the RECON task:			
• Geospatial Data and Geospatial Data Systems?	_____	_____	_____
• Spatial Data Reference System?	_____	_____	_____
• Base Mapping?	_____	_____	_____
• Composite Data Modeling?	_____	_____	_____
• Scale and Resolution?	_____	_____	_____
• Imaging/Remote Sensing?	_____	_____	_____
• Probability of Detection?	_____	_____	_____
• Horizontal Accuracy?	_____	_____	_____
• Spatial Analysis/Stratification?	_____	_____	_____
• Quality Control?	_____	_____	_____
2. Have the following components of the RECON task been considered in the SOW:			
• Work Plan preparation?	_____	_____	_____
• ASSHP preparation?	_____	_____	_____
• Archival data compilation and correlation?	_____	_____	_____

	Y	N	N/A
• Geospatial data collection:			
– Aerial mapping?	_____	_____	_____
– Conventional mapping?	_____	_____	_____
• Data analysis/footprint definition?	_____	_____	_____
• Field confirmation?	_____	_____	_____
• Geophysical technology assessment?	_____	_____	_____
• Data Archive?	_____	_____	_____
• Report preparation?	_____	_____	_____